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AGRICULTURAL NEWS LETTER

VOL. 4 - NO. 3 MARCH 1936

THIS PUBLICATION GIVES INFORMATION on new developments of interest to agriculture based on the work done by scientists and agricultural field men of the du Pont Company and its subsidiary companies.

It also gives reports of results obtained with products developed by these companies in the field whether the tests are made by field men of the companies, by agricultural experiment stations or other bodies. Also data on certain work done by agricultural stations on their own account and other matters of interest in the agricultural field.

This issue contains:

Thiodiphenylamine, a new Synthetic Substitute for Lead Arsenate in Control of Codling Moth.

Poultrymen Benefit from the Development of "Cel-O-Glass" Many Tests Demonstrate.

Illinois Agricultural Experiment Station Reports on Seed Treatment Investigations.

The North American Wildlife Conference Starts National Movement to Save a National Resource.

Greater Efficiency and Economy in Ditching Obtained by Proper Loading of the Dynamite.

Issued by
Publicity Department,
E. I. du Pont de Nemours & Co.,
Wilmington, Del.

Printed in U.S.A.

THIODIPHENYLAMINE A NEW SYNTHETIC SUBSTITUTE FOR LEAD ARSENATE IN CONTROL OF CODLING-MOTH

EDITOR'S NOTE:- The important development discussed below is typical of the achievements of the research staff of the du Pont organization in developing new products of great economic value to agriculture. This paper by Dr. Salzberg presents facts which will be read with interest.

By Paul L. Salzberg, Research Chemist,
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The accumulating evidence of the dangers involved in poisonous insecticides and the increasingly severe legal restrictions placed on spray residues on fruits and vegetables has stimulated an intensive search for new insecticides highly toxic to insects and yet safe from the standpoint of the consuming public. That such specificity is possible of attainment is indicated by the fact that certain plant extractives are highly toxic to some insects and yet are said to have relatively little effect when taken orally by higher animals. The natural plant extractives, however, have not provided us with an ideal insecticide possessing all of the properties essential in a commercially successful product, such as stability, lack of volatility, and availability at low cost and in uniform quality. We have long recognized the importance of attacking this problem from the standpoint of a synthetic organic insecticide which is free from the objections to poisonous inorganic residues and which can be designed specifically for the application under consideration by suitable modifications of the chemical structure. It is now possible to report that very definite and substantial progress is being made in this direction.

The Grasselli Chemical Company during the past several years has made an extended study of the insecticidal action of thiodiphenylamine. This substance, also known as phenothiazine, has recently attracted considerable attention as a synthetic substitute for lead arsenate in the control of codling-moth. The high efficiency of this product as an insecticide is recognized, for example, by recent reports of the U.S. Department of Agriculture showing it to be even more effective than rotenone in tests carried out on mosquito larvae. Furthermore, their laboratory tests have shown it to be more effective than lead arsenate in the control of codling-moth on apples but larger scale experiments in orchards with a very crude form of thiodiphenylamine gave generally unsatisfactory results.

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Production Process Developed

In pursuance of its investigation of the various factors involved in the insecticidal action of thiodiphenylamine, Grasselli has developed a technical process for preparing this substance in a high state of purity and in a suitable form for application. A considerable quantity of this preferred composition was manufactured for practical trials in apple orchards and the results of these tests indicated that when used under certain conditions, thiodiphenylamine is a very effective control for codling-moth. Field experiments will be continued in order to define the most satisfactory methods of application and the optimum concentrations required for commercial control of a wide range of insects. In order to expedite the evaluation of this interesting material by entomologists throughout the country, larger quantities are being made available for further tests during the 1936 season.

Thiodiphenylamine is very readily prepared by the reaction of sulfur with diphenylamine. Since diphenylamine is already being manufactured in large quantities by a department of the du Pont Company, thiodiphenylamine presents unusually favorable prospects for becoming commercially available. Furthermore, since the ultimate precursors are benzene, ammonia, and sulfur, a practically unlimited supply of domestic raw material is assured.

POULTRYMEN BENEFIT FROM THE DEVELOPMENT OF "CEL-O-GLASS" MANY TESTS DEMONSTRATE

EDITOR'S NOTE:- This brief discussion of a subject with which most poultry technical workers and many others are familiar is presented here because of the belief that the poultry industry could be benefitted by a wide extension of the use of the material described.

Research has definitely established the fact that the ultra-violet rays of sunlight will aid in the prevention of rickets in baby chicks equally as well as cod liver oil.

Hatchability, fertility, egg production and shell texture are likewise favorably influenced by ultra-violet rays present in sunlight.

A problem that once was faced by the poultryman was the maintaining of the proper temperatures of brooding houses and laying houses, and the providing of sunlight. This condition was complicated by reason of the fact that it had been shown that ordinary window glass filters out the ultra-violet rays, although the infra-red rays are readily transmitted.

Scientific approach to the problem of at once permitting the required regulation of temperature and providing the benefits of ultra-violet ray radiation resulted in the development of a flexible transparent plastic coating for wire mesh to be used in windows of poultry houses. When put into commercial production, this material was given the registered trade name, *"Cel-O-Glass." It is to be noted here that the adoption of this trade name serves not only to protect the manufacturer of the product, but users, as well.

Tests of "Cel-O-Glass" have demonstrated that it transmits more than 30 per cent of the biologically active ultra-violet rays of sunlight. It also filters out the infra-red rays. These transmissive and filtering properties are exactly the reverse of those of window glass, since the latter excludes the ultra-violet rays and admits the infra-red ones.

The Results of Practical Tests

The Ohio State Experiment Station, following a ten-weeks' experiment with three groups of baby chicks -- one group having access to direct sunlight, a second group being protected by "Cel-O-Glass", and the third group being kept behind window glass--reported that no outstanding or apparent differences were noted between the group

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exposed to direct sunlight and the one receiving sunlight through "Cel-O-Glass." The tabulated report further showed that at the end of eight weeks, at which time the "window-glass" group was discontinued, all chicks showed evidence of serious leg weakness. At the end of the 7th week the 96 surviving "Cel-O-Glass" chicks weighed 84.5 pounds as compared with 61.5 pounds for the window-glass group. Numerous other tests gave similar results in regard to the development or lack of rickets in baby chicks, and in their growth.

In poultry houses, "Cel-O-Glass" has demonstrated its insulating property through tests which showed temperatures of 10 to 20 degrees higher than those obtained with window glass. This proved a factor in winter egg production. Tests over seven months, made by Dr. C. H. Howard of Rutgers University, showed that the egg production where "Cel-O-Glass" was used was more than double that where window glass was used.

*"Cel-O-Glass" is the registered trade name of E. I. du Pont de Nemours & Company for the product described.

ILLINOIS AGRICULTURAL EXPERIMENT STATION REPORTS ON SEED TREATMENT INVESTIGATIONS

EDITOR'S NOTE:- Here is presented, in part, the general summary and conclusions from Bulletin 420, titled "Seed Treatments for the Control of Certain Diseases of Wheat, Oats and Barley", published by the Agricultural Experiment Station, University of Illinois, Urbana, Ill.

Major diseases of wheat, oats, and barley that can be wholly or partially controlled by seed treatment are described herein. These include stinking smut, loose smut, and scab of wheat; loose smuts, covered smut, stripe, scab, and blight of barley; and smuts of oats.

Early in the past decade a number of new organic mercury disinfectants became available for experimental use, which gave special promise for the control of certain seed-borne diseases without causing seed injury. Still better disinfectants of this type, which could be used in dry form for dusting the grain, became available a little later.

Experiments to determine the value of these new materials and some of the older ones were conducted over a period of twelve years. Some of the materials tested were worthless, and some others which were used in wet form are now obsolete. Two of the dry disinfectants - copper carbonate and ethyl mercury phosphate - are filling a real need at the present time.

Yield tests with treated grain were conducted by the rod-row method at the Station farm at Urbana and at a few other places in the state. Seventy cooperative tests also were made with oats and barley by farmers on a large scale under practical farm conditions.

Wheat stinking smut was controlled and good increases in yield from infected seed were obtained with copper carbonate, ethyl mercury chlorid ("Ceresan"), and ethyl mercury phosphate (New "Ceresan"). The 18-to-20-percent copper carbonate apparently was as effective as that with a higher copper content. For the control of the seedling disease caused by scab, the organic mercury compounds gave best results. When treatments were made on nearly disease-free wheat seed, copper carbonate gave best increases in yield. All three of these disinfectants caused an increase in the winter survival of winter wheat plants.

The benefits derived from treating noninfected wheat seed, however, were not always enough to warrant the trouble and expense of treatment. In areas where wheat is not a major crop but is grown

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in rotation with a number of other crops, it is recommended that the seed be treated only when stinking smut or scab infection occurs. In areas where wheat is grown more extensively, the seed should be treated every year.

Oat smuts were well controlled with formaldehyde treatments applied by several methods and with "Ceresan" and New "Ceresan". New "Ceresan" has resulted in better yields than formaldehyde, the increase being more than enough to pay for the difference in cost. Formaldehyde applied by the spray or sprinkle methods is the cheapest treatment and is recommended as second choice. Formaldehyde dust was found to deteriorate rapidly in storage. Unless a farmer can be very sure that the material he buys is fresh, formaldehyde dust is not recommended. While "Ceresan" and New "Ceresan" have given significant increases in yield when smut-free seed was used, it is questionable whether treatment every year should be recommended. However, smut is blown for miles and a smut-free field gradually becomes reinfected. Treatment at least every second year would therefore seem to be well worth while.

The barley diseases considered in these experiments were stripe, scab, and three kinds of smut. "Ceresan" and New "Ceresan" proved outstanding in controlling these diseases and increasing the yields of grain. An objectionable amount of smut may sometimes persist after seed is treated with New "Ceresan", for one of the three kinds of smut that cause trouble can be controlled only by the hot-water method. The variety Wisconsin Pedigree 38 is highly resistant to stripe disease and so far has not shown much smut infection. When this variety is used, seed treatment is recommended only when the seed is infected with scab or if smut infection should become important.

Some seedling diseases, as well as latent smut infection, were doubtless controlled by the better seed disinfectants. At least certain treatments applied to smut-infected wheat and oat seed caused much larger increases in yield than could be accounted for by the substitution of sound heads for smutty heads.

"Ceresan" is a trade mark registered in the U. S. Patent Office by the Bayer-Semesan Company, Wilmington, Delaware.

THE NORTH AMERICAN WILDLIFE CONFERENCE STARTS NATIONAL MOVEMENT TO SAVE A NATIONAL RESOURCE

EDITOR'S NOTE:- The conserving and increasing of wildlife, it is recognized, must become a matter of concern to practically everybody. This, however, particularly demands the attention of those connected with agricultural pursuits, since the losses would fall the heaviest on farmers and their farms. Conversely, any betterment of present conditions would result in greater benefits to agriculture than in any other direction.

It is a significant fact that the people of the United States show evidence of becoming thoroughly aroused over the threatened extinction of various species of formerly abundant useful wildlife and an alarming decrease in numbers of even some of the present most common kinds.

Substantial basis for the belief that at last something really constructive is to be done in the matter, and on a scale never before attempted, was provided by the outcome of the North American Wildlife Conference, held in Washington, D. C., February 3-7.

The conference assembled at the call of President Roosevelt. In an official announcement, he said: "My purpose is to bring together individuals, organizations and agencies interested in the restoration and conservation of wildlife resources. My hope is that through this conference new cooperation between public and private interests, and between Canada, Mexico and this country, will be developed; that from it will come constructive proposals for concrete action; that through these proposals existing State and Federal governmental agencies and conservation groups can work cooperatively for the common good."

The response to the President's invitation was gratifying in the highest degree, for, when the roll of States was called practically every one of them responded. There were also present delegations from Canada and Mexico. Representation included Federal, State and Provincial officials, scientists, naturalists, conservationists, sportsmen's clubs, nature associations, junior groups, farm organizations, women's clubs, garden clubs and other interested units. In all, nearly two thousand persons were in attendance.

F. A. Silcox, Chief of the United States Forest Service, was appointed chairman of the conference committee, which included many distinguished for their activities in conservation and other lines.

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Some Results of the Conference

Commenting on the aims and achievements of the conference, Ira N. Gabrielson, Chief, Bureau of Biological Survey, United States Department of Agriculture, said, in part: "First, the main objective of the conference was the organization of a federation of all groups interested in wildlife; in other words, the effective mobilization of all agencies, organizations, and individuals interested in restoring and conserving our wildlife. Second, the conference was planned so as to bring together specialists with new discoveries and the information so important in determining wildlife practice and policies. Finally, the conference was called to formulate a wildlife program for the future.

"The conference accomplished these aims. It tentatively organized a general federation of wildlife interests. It put on record many special papers and discussions. It took steps toward the formulation of a national program.

"As a matter of fact, the Wildlife Conference did not actually establish a general federation. But it did draw up a suggested constitution for such a federation, and the conference unanimously endorsed this action. Furthermore, it elected as acting president, none other than J. N. (Ding) Darling. Now the members of the conference are carrying these plans for a general federation to their home communities. I hope that you will have a federation in your community. As soon as the suggested constitution is ratified by state and regional groups the general federation will be actually under way. So, I think we can safely say even now that the North American Wildlife Conference of 1936 was the birthplace of our first general federation of wildlife interests."

GREATER EFFICIENCY AND ECONOMY IN DITCHING OBTAINED BY PROPER LOADING OF THE DYNAMITE

EDITOR'S NOTE:- There is discussed here one of the most common mistakes made in ditch blasting, and instructions are given for obtaining maximum results by proper loading.

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One of the mistakes most frequently made in ditch blasting is the loading of the dynamite too deep in the ground. Beginners usually make the holes too deep and, not infrequently, those with more or less experience err in this respect.

As a general practice, the dynamite should be placed at a depth of approximately one-half the desired depth of a ditch. There is, however, an important exception to this accepted rule. The exception, rather than the usual rule, applies when there is shallow muck of from two to four feet in depth with a clay or sand hard bottom beneath it. Such a condition is frequently encountered. It is made evident when holes are put down and the punch bar comes in contact with hard material.

If the required depth of a ditch is no greater than that of the underlying solid material, it is best to load the dynamite as close as possible to the hard stratum. The reason for this is because an explosion is a rapid expansion of gases which travel equally in all directions until coming in contact with greater resistance at some point. Therefore, the muck, offering less resistance than does more solid material, will be blown upward and outward. As a result, an excellent ditch may be obtained with the use of a minimum amount of explosives.

Under ordinary conditions, if a cubic yard of muck or other wet material is thrown out with one pound of ditching dynamite it is considered very satisfactory. But, in many instances where the loading is against a hard bottom, a pound of dynamite has moved two to three cubic yards of material.

With the single exception that less dynamite is required for blasting under the condition described, the loading procedure is identical with that for any other ditching work of like character where the propagated method is applicable.

Blasters Should Observe Safety Rules

This, or any other kind of ditch blasting, may be done successfully by anyone familiar with ditching practices. It is most important, nevertheless, that the blaster thoroughly understand all rules concerning the safe handling and use of explosives and observe these rules implicitly.

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